Complete Driveway Designs Ltd

User Guide

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1.0 Introduction

Pattern Imprinted Concrete (PIC)

Believe it or not, concrete has been used for thousands of years. Today it is one of the most popular construction materials available. The material is strong, durable and versatile, however this does not mean it is perfect. As end users we need to understand its flaws and weaknesses in order to preserve and prolong the life of our driveways and patios. This user guide is designed to explain Pattern Imprinted Concrete, the part we play as installers, and the part you play as users.

Pattern Imprinted Concrete has been introduced from America. It is recognised that they use concrete much more widely than we do in this country. Most of our tools are imported from America, even some of our materials are imported because of patents. Over the years the technology revolving around printing concrete has evolved. We specialise in what is commonly known as powder printing.

After this introduction the guide is divided into three areas

Design	**(Consultation between customer and surveyor)**
Installation	**(By CD Designs installation team)**
Maintenance	**(Consumer responsibility. See our maintenance services)**

The Life Story of Concrete…..

Everything has a life cycle, and concrete is no exception. Concrete consists of cement, large aggregates (usually 20mm or 10mm) and fine aggregates (usually sharp sand or concrete sand). These, mixed together form concrete. One ingredient we have not mentioned is water, which must be added to initiate a chemical reaction with the cement. Water plays an important part in the formation of concrete; it also can be the main cause for its deterioration.

Concrete cures fastest in the first seven days and normally reaches its desired optimum strength about day 28. What we need to understand is that concrete does not stop curing at day 28 it continues, just at a much slower rate. This continues until about the year 20, give or take a year, and then it starts to deteriorate. It will generally take about 1000 years to fully decompose.

Generally speaking concrete has quite a good life cycle. This is all very well, but they are factors which affect our concrete.

Natural Factors

We as installers and you as users can help preserve our concrete by understanding the natural forces which affect concrete. This can be done prior, during and after installation. Section ‘4.1 Concrete’ outlines these factors (physical, chemical, thermal and structural) and what can be done to overcome some of these factor. This section helps you understand what we do during the installation of your driveway or patio.

User Factors

As you would expect, anything that is used with care and maintained will last a lot longer. The main section of this user guide is the maintenance section. It is intended to provide the end user with the information required to maintain the driveway or patio should they wish to do so, or take advantage of our service packages.

2.0 Design

Patterns

A variety of stamped patterns are available on the market today that add natural-looking effects and dimensions to concrete. We stock over 30 different patterns; these are detailed on our website. This is not an exhaustive list, there are many more patterns which are available to us through our suppliers should you wish to be more adventurous.

Colour
(Base Colour)

We can offer a wide range of colours which would complement any household. The colour Hardener is UV resistant and tested to British Standards. The colour hardener does what it says, it makes the surface 20-30% harder wearing, and this is an important and integral part of our Pattern Imprinted Concrete Installations. Without this the surface would wear a lot quicker, the cement paste would break down, and the aggregates would be exposed. It is not unusual to see concrete where there is exposed aggregate. This tends to be in older slabs where no sealant has been applied, and weathering and wear and tear has eroded the cement paste. This would not affect the function of the concrete slab and aesthetically add character. For pattern imprinted concrete it is essential the surface is protected, the first line of defence is the colour hardener followed by a coat of seal. All standard colours are displayed on our website.

(Secondary Colour)

The secondary colour in the form of antiquing agent comes in the same colours as the base colours above. The tendency for most domestic projects is to imitate real stone/slate/cobble/tile etc.. therefore the common colours tend to be black and browns.

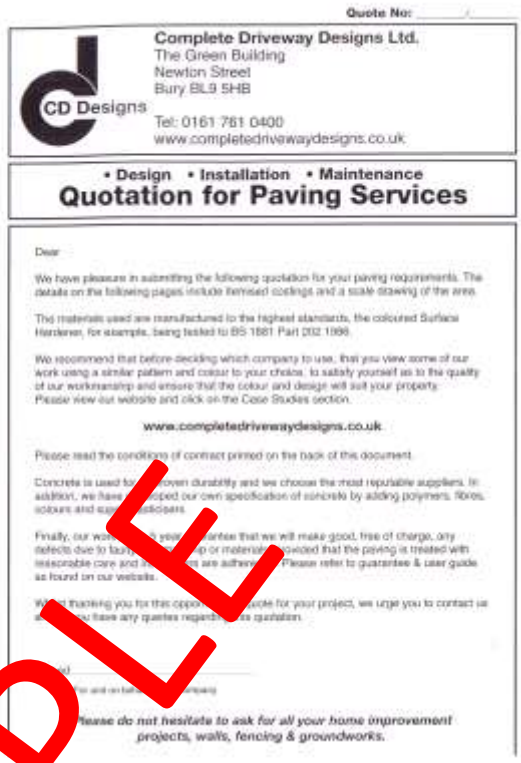
Design Ideas

The best place to start when looking for ideas for pattern and colour etc… is to look at what already exists. You want to achieve harmony with the colour and pattern, not a glaring contrast.
The construction of the building is probably the best place to start, since most driveways will lead you to the house. Similar construction materials should be chosen. Choosing colour is just as simple, look at structural elements of the house, doors, windows, roof etc.. try to choose complementary colour.

Our case study section on our web sites shows constructed and finished examples of patterns and colours against existing properties. These case studies are constantly updated, and new ideas are available all the time. Take note of existing installations when on your travels, there are lots of examples around today, both domestic and commercial. (Theme Parks, Drive Through, KFC etc..)

2.1 Final Survey Report

Conditions of Contract



Quote No: _____/_____

Complete Driveway Designs Ltd.
The Green Building
Newton Street
Bury BL9 5HB
Tel: 0161 761 0400
www.completedrivewaydesigns.co.uk

• Design • Installation • Maintenance

Quotation for Paving Services

Dear

We have pleasure in submitting the following quotation for your paving requirements. The details on the following pages include itemised costings and a scale drawing of the area.

The materials used are manufactured to the highest standards, the coloured Surface Hardener, for example, being tested to BS 1881 Part 202 1986.

We recommend that before deciding which company to use, that you view some of our work using a similar pattern and colour to your choice, to satisfy yourself as to the quality of our workmanship and ensure that the colour and design will suit your property. Please view our website and click on the Case Studies section.

www.completedrivewaydesigns.co.uk

Please read the conditions of contract printed on the back of this document.

Concrete is used for ... proven durability and we choose the most reputable suppliers. In addition, we have developed our own specification of concrete by adding polymers, fibres, colours and ... additives.

Finally, our work ... we will make good, free of charge, any defects due to faulty ... workmanship or materials, provided that the paving is treated with reasonable care and ... conditions are adhered to. Please refer to guarantee & user guide as found on our website.

We look forward thanking you for this opportunity ... quote for your project, we urge you to contact us ... should you have any queries regarding this quotation.

Yours ...

... and on behalf of ... Paving

Please do not hesitate to ask for all your home improvement projects, walls, fencing & groundworks.

complete driveway designs Final Survey Report

CD Job No: _____/_____

Complete Driveway Designs Ltd

Telephone:
Fax:
Web: www.cd-designs.co.uk
Sales Representative Mobile -

Contact: Date:
Name:
Address:

Postcode:
Tel Home: Tel Work:
Tel Mobile:

Manholes: Qty:
Accs: Metres:
Deco: Metres:
Gulleys: Qty:
Steps: M
Corners: Metres:

Additional works by client:

Pattern	Colour	Pullovers	Size

Deposit £ Part VAT
Survey Payment £
Final Payment £
Total £

Colour Samples Shown: Y/N
Surveyor:
Customer Approval:

Approx. fit date:

SAMPLE

2.2 Additional Works Form

CD Job No: _____/_____

Complete Driveway Designs Ltd.
The Green Building
Newton Street
Bury BL9 5HB

Tel: 0161 761 0400
www.completedrivewaydesigns.co.uk

Additional Work Required

SAMPLE

NOTES:

Cost: _____
VAT: _____
Total: _____

2.3 P.I.C. Driveway Specification

The contract will include full excavation of area and removal from site of all spoil and waste. The area will then be shuttered and pegged and a base of MOTT, or similar will be formed.

Once the ground work has been completed, a pour of P300 mix or similar will be put into the prepared area. Each cubic meter contains 300kg cement, 890kg fine aggregate and sand, 965kg 10mm limestone. Also included is Polypropylene Fibre mesh reinforcing and 5% entraining agent, slump (S2) dependant on weather conditions. Depth of concrete will be 100mm throughout.

The area is then screeded and bull floated to ensure correct falls and inclines, then coloured and printed to your choice and left to cure. During this time the area is "wet" and traffic must stay off. The area remains "wet" for 24-36 hours depending on time of year.

Upon hardening the area will be washed off and allowed to dry, crack control joints will be added where necessary, before sealing with an acrylic sealant. Please keep vehicles off site completely until 48 hrs after sealing. Please refer to "User Guide".

Preparation

Excavation Depth	200mm (1)	
Membrane Type	Visqueen(2)	
Sub-Base Type	M.O.T.T. Type 1 (3)	
Sub base Depth	100mm	
Drainage	As required (Site Specific)	
	Deco	
	Aco	
	Insert Manholes	
	Gulley Tops	
	Salt Glazed Pots/ Clay Pots	
	Soak-away	
Formwork Shutters	As required (Site Specific)	
	Edgings	
	Steps	
	Kerbs	

Concrete (Un-Reinforced Slab Design)

Concrete Depth	100mm		
Concrete Specification	(BS 8500) Basic Mix		
Cement CEM1			
	AGG(1)	Limestone	
	AGG(2)	Concrete Sand	
	Admix(1)	Polypropylene Fibremesh	
	Admix(2)	Air Entrainment	
	Mix/Grade	P300 (4)	
	Max/Agg Size	20mm (5)	
	Consistency		
	Class	S2	
		Slump Range	50-90 (mm)
		Range	-20 - +30 (mm)
Mix Design	Kg/Per Cubic Meter		
	Cement	300kg	
	Agg(1)	890 kg	
	Agg(2)	965kg	
Colour Hardener	BS1881;Pt.202:1986		
Release Agent			
Sealant	% solid (6)		
	%Xylene		
Add Mix (1)	Thinners (7)		
Add Mix(2)	Anti Slip		
Add Mix(3)	Uncle Grip		
Add Mix(4)	Matting Agent		

Excavations will generally be a minimum of 200mm deep unless suitable sub-base is exposed.
Membranes are used on all interior concrete laid. It is not necessary or required for exterior concrete unless specified.
The contractor should be satisfied that the existing sub-base is suitable.
Concrete will be ordered with requirements particular to the ambient conditions. The mix is a basic guideline mix, there will be seasonal variations.
In the occasion that 10mm aggregate is not available then 20mm will be used.
The seal is a one coat application, as standard it is a gloss finish.
The required amount of thinners is dependant on usage.

SAFETY DATA SHEET BB/001

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY

PROSEAL & ADSEAL TRADE & SUPER

T.D.S Group Ltd, Unit 5A Rakes Clough Ind. Est., Rakes Lane, Bolton, BL3 1RF
Tel: 01204 362828 Fax: 01204 362828 E-mail: enquiries@advancedsealingsolutions.co.uk

2. COMPOSITION / INFORMATION ON INGREDIENTS

Blend of acrylates and dimethylbenzene with special admixtures.

Component	%	CAS Nr	EECS Nr	Index Number
Acrylate	10 - 30	80-62-6		
Dimethylbenzene	15 - 80	1330-20-7	202-422-2/ 215-535-7	601-022-00-9

3. HAZARDS IDENTIFICATION

Risk Phrases	R10	Flammable
	R20/21	Harmful by inhalation and contact with skin
	R38	Irritating to Skin
Labelling Requirement	Xn -	Harmful Xi - Irritant

4. FIRST AID MEASURES

Inhalation	Move the exposed person to fresh air. Keep warm and at rest. Perform artificial respiration if breathing has stopped. If breathing is difficult, give oxygen. Obtain medical attention urgently.
Skin Contact	Wash skin with soap and water. Remove contaminated clothing which should be washed or dry cleaned before reuse.
Eye Contact	Wash eyes with copious amounts of water while lifting the eyelids. Continue to rest for at least 15 minutes. Obtain medical attention urgently.
Ingestion	Rinse mouth thoroughly. Keep warm and at rest. Perform artificial respiration if breathing has stopped. If breathing becomes difficult, give oxygen. If conscious, give water to drink but do not induce vomiting because of risk of aspiration. Seek medical attention immediately.

5. FIRE-FIGHTING MEASURES

Fire-Fighting Procedures	Use dry chemical or Carbon Dioxide (CO^2). Do not use water jet as this will spread fire. Use water spray to reduce vapours. Keep fire-exposed containers cool with water spray. Wear self-contained breathing apparatus.
Special Hazards	None
Hazardous Combustion Products	Fire produces Smoke, Carbon Monoxide, Carbon Dioxide and Water.

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SAFETY DATA SHEET BB/001

6. ACCIDENTAL RELEASE MEASURES	
Personal Precautions	Eliminate ignition sources. Wear Rubber or PVC gloves and goggles. Avoid Contact with liquid. Provide ventilation and confine spill.
Environmental Precautions	Do not allow runoff to sewer. If this occurs, inform authorities.
Methods of Cleaning	Absorb in dry sand, earth or vermiculite and place into containers.

7. HANDLING AND STORAGE	
Handling	Keep away from ignition sources. Avoid spilling, skin and eye contact. Ventilate well, avoid breathing vapours. Wear approved respirator if air contamination is above accepted level. Keep container closed at all times when not in use.
Storage	Keep away from oxidizers, heat, flames and direct sunlight. Store in cool, dry, well ventilated area in closed containers. Take precautionary measures to prevent static discharges.
Packaging Materials	Contain in mild or stainless steel containers. Plastics and rubbers are unsuitable.

8. EXPOSURE CONTROLS

Maximum exposure limits and occupational exposure standards are listed in HSE's EH40 document which should be referred to for the most up to date data. (HSE's Toxicity Review Series TR26 document gives additional information).

Exposure Limits	Long term exposure limit TWA 8 hr 100 ppm (441 mg/m³). Short term exposure limit TWA 15 min 150 ppm (662 mg/m³). SK = Can be absorbed through skin.
Respiratory Protection	If exposed to high concentrations of vapour wear self-contained breathing apparatus.
Hand Protection	Use protective gloves made of PVC or Butyl Rubber.
Skin Protection	Wear protective apron and boots.
Eye Protection	Wear chemical goggles. Provide eyewash station and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES	
Appearance	Coloured solution
Odour	Aromatic
pH	Not applicable
Boiling Point	ca. 200°C
Freezing Point	Not applicable
Flammability	Flammable. Flammable limits 1.1—6.6 vol%
Auto ignition temperature	500°C
Explosion Hazard	Low to Moderate
Oxidising Properties	Not Oxidising
Vapour Pressure	Approx. 8.0 mbar at 20°C
Solubility in Water	Immiscible
Solubility in Solvents	Soluble in most solvents

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SAFETY DATA SHEET BB/001

10. STABILITY AND REACTIVITY	
Stability	Stable under normal conditions
Materials to avoid	Strong oxidizing agents and concentrated mineral acids, alcohols, water, amines
Conditions to avoid	Heat, Flames and other potential sources of ignition
Decomposition Products	Hazardous decomposition products but none when handled correctly.

11. TOXICOLOGICAL INFORMATION	
Toxicological Data:	LD_{50}(ORAL RAT) 4.8g/kg.
Inhalation	Concentrations of around 200-400 ppm will irritate nose, throat, and upper respiratory tract. Progressively higher levels cause flushing, dizziness, tremors, CNS depression and coma. Rpeated exposure may cause headaches, fatigue, drowsiness and possible dyspeptic disorders. No evidence of blood disorders.
Skin Contact	Irritations and Defatting of skin. Leading to dryness and possibly blistering or dermatitis. Absorbed through intact skin but unless contact is repeated or prolonged this is unlikely to be a significant hazard.
Eye Contact	Vapour concentrations in excess of 200 ppm cause irritation. Liquid causes conjunctivital irritation with possible corneal burns.
Ingestion	Practically non-toxic. Irritates mouth and may cause sever gastrointestinal distress. Aspiration into lungs is hazardous because of risk of chemical pneumonitis. Ingestion of large amounts may produce depression or CNS.

12. ECOLOGICAL INFORMATION

Do not allow to escape into waterways, waste water or soil.

13. DISPOSAL CONSIDERATIONS

The relevant EC Directives and local, regional and national regulations must be complied with.

European Waste Catalogue (EWC) code: 080102 Waste products from MFSU of paint and varnish.

14. TRANSPORT INFORMATION	
UN Number:	1307
Class:	3.0.0 Flammable Liquids
Packaging Group	III
RID/ADR	3 Inflammable Liquids
IMO Class	3.3 Flammable Liquids
IMDG Code Page Number	3394 Amdt 25-89
ICAO/IATA Class	3 Flammable Liquids
Kemler Code	30
Tremcard Number	TEC(R)33 OR 61G07C
CCT Number	2902 4490

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Material Safety Data Sheet

GUNWASH THINNERS

_____

Identification _____

Product Name

Use:

"GUNWASH THINNERS"

Degreasing/ Solvent

UN Number: 1268 Dangerous Goods Class: 3 Poisons Schedule: 5 Hazchem Code: 3Y Packaging Group: II N/A = Not applicable

clearish liquid <160 - 275 1.0 .808 - .825 immiscible flammable N/A

>100.0 %

Physical Description/Properties

Appearance: Boiling Point: (Deg. C) Vapour Pressure: Specific Gravity: (at 25 Dec. C) Solubility in Water: Flammability Limits: pH asis

Ingredients

Ingredient Liquid Hydrocarbons

CAS No 8008-20-6

 _____

Health Hazard Information _____

Health Effects

Swallowed: Eye: Skin: Inhaled:

First Aid

Swallowed: Eye: Skin: Inhaled:

Single dose oral toxicity is low. May cause pain, may irritate eyes. Prolonged contact may cause flaking or drying of skin. Slightly irritating to respiratory tract.

Do not induce vomiting, give plenty of water & seek medical attention.

Immediately hold open eyes open and flush with water continuously for at least 15 minutes. Seek medical attention.

Remove all contaminated clothing and wash affected area with plenty of water and soap and seek medical attention.

Remove from further exposure and apply artificial respiration if not breathing. Seek medical attention.

Advice to doctor _____

Precaution for Use _____

Exposure Limits Ventilation Personal Protection

Flammability

Not established, Suggest keep below 10mg/m3 Extra ventilation may be required.

No Smoking, eating or drinking during handling. Avoid any contact with the product. Wear safety goggles, suitable breathing apparatus and gloves

The product is flammable.

Treat symptomatically.

_____

Safe Handling Information _____

Storage & Transport Spills & Disposal

Fire & Explosive Hazard

Other Information

Product is a class 3 Flammable. Store indoors in a dry well ventilated area.

Wear protective clothing, goggles and protective gloves. wear a suitable respiratory device if spillage is in a confined space. Dispose in accordance with local authorities regulations

Flammable, extinguish with carbon dioxide dry chemical or halogen (BCF).

Keep containers cool by spraying with water to prevent pressure build-up and drums bursting.

The information presented herein is true and accurate to the best of our knowledge, but without guarantee unless explicitly given. Since the conditions of use are beyond our control, we disclaim any liability including for patent infringement incurred in connection with the use of these products, data or suggestions.

Contact Point:

Signed:

Note:

Glyn McDonald Sierra (AUST) PTY. LTD. 17 Delta Street GEEBUNG QLD 4034

Phone: (07) 3216 5099 Fax: (07) 3216 5199

Glyn McDonald

Date of issue: 16th September 2007

This issue supersedes and replaces all previous issues.

3.0 Customer Guidelines – About Your Installation

Guidelines

Start date will be confirmed by the company and will be given as a week commencing date. The actual day of the week will be confirmed 24-48 hrs in advance

All time scales for the contract durations should be discussed with the foreman of the installation team on day one, as size and intricacy can increase the duration of installation.

Could you please inform neighbours about commencement of this work as the construction process does involve scattering of colour release powder over the surface which can result in dust being blown about.

Please protect immediate areas behind the front door etc.. with dust cloths until we leave site. This will prevent dirt and dust damaging your carpets etc..

In certain cases the process will involve walking over your garden and border plant areas. Could you please remove/protect your favourite or valuable plants until after completion to prevent any damage.

Access will be restricted during the pouring of the concrete and curing period thereafter. Can you please discuss with the foreman of the team and make adequate provisions so it does not affect your routine or access.

On the day the concrete is poured and imprinted can you please make sure all your windows and doors are kept closed. It Would be advisable to inform neighbours again at this stage.

Please ensure water and electricity is available at all times.

Installation Of The Driveway Will Be Made Up Of The Following:-

The installation team will discuss the installation procedure prior to commencement of work.

Excavation of the driveway will be to a minimum depth of 100mm and normally up to 200mm, removing all topsoil and exposing a suitable sub grade soil. Existing sub bases may be re-used.

Once site has been covered with suitable stone and well compacted down with vibrating plate, all Manhole, gullies and drainage will be installed.

The shutters will be positioned and fixed to the desired shape, as depicted on the driveway survey report. All levels and falls will be checked at this point.

Typically the driveway will be constructed with a 100mm thick concrete slab, which is air-entrained and has fibre reinforcement added at the batching plant. The concrete is tamped and floated prior to adding the colour and release of your choice. The whole area is then imprinted with the pattern to the design showed on the driveway survey report.

When the driveway has been imprinted the site will be closed off using hazard tape or similar. Responsibility for the driveway will then pass to the client to prevent any damage to the soft concrete by the arrival of guests or dogs, cats, postmen etc..

The driveway will then be left for up to 24-48 hours to cure before the crack control joints are cut into the slab. This will be left to the discretion of the company. The science behind the crack control joints is documented in our website.

The driveway will then have the release powder brushed off, prior to cleaning with a power wash, which will expose the true colour of the pattern imprinted concrete. Any flaws or imperfections will then be attended to prior to sealing the whole unit, leaving you with a beautiful and pristine driveway.

The whole site will then be cleaned and left in a clean condition as found when first attending site.

Please note:-
Any Final balance and completed customer satisfaction Notice will be collected by the installation team.

Weather conditions do have a strong bearing on the whole installation, from start date being maintained to the completion of the driveway –please bear with us.

Please do not park vehicles on the driveway for 72 hours after the sealing coat has been applied.

4.0 Driveway Maintenance

As you would expect a **plain** concrete driveway shouldn't require any maintenance at all, although over time the surface of the concrete will wear off exposing the aggregate underneath. Evidence of this is all around us if we look around. And why would we? We walk/drive over it and never question its appearance. The exposed aggregate poses no problem, and adds to the character to the surface of the plain concrete slab. This does not affect the integrity or function of the plain concrete.

Patten Imprinted Concrete is a different story altogether. It is important for us as users to understand how to protect and maintain the colour and texture in the printed concrete. We do this by applying a resin or sealer to the surface of the concrete. This prevents the cement from wearing off over time, it also provides a barrier to oil and other stains as well.

One of the best attributes of printed concrete is how little maintenance and routine care it will need over its life time, but no driveway paving material including concrete is truly maintenance free. It is important for us to understand the characteristics of concrete in order for us to properly treat and maintain our driveways. This section is divided into two sections **Concrete Maintenance** and **Sealant Maintenance**.

Concrete Maintenance explains physical, chemical, thermal and structural factors which cause concrete to fracture. As users we need to be aware of these factors so we don't contribute towards them, for example:

-Don't overload your drive, large vehicles etc (structural).

-Avoid using de-icing chemicals in winter because they can cause surface damage - Primarily scaling and sprawling (chemical/thermal/physical).

-Products containing ammonium nitrates and ammonium sulphates will actually attack the concrete chemically (chemical).

-Avoid use of metal objects on drive that may scratch the surface, i.e. shovelling etc (physical) .

We have made an attempt to explain the cause and effect these factors will have on our concrete driveway.

Sealant Maintenance explains why we need to seal our concrete, the types of seal available to us and the choice of seal we use on our driveways. It explains the causes of our new driveway fading in colour or blooming. The effect it will have on our driveways and remedial action required to restore it to its former glory.
There is a section which explains how the sealant works. It is these principles which you would need to understand if you were to consider resealing your own drive. We have also outlined some guidelines and good practice with regards to resealing your own driveway.

4.1.1 Crack Prevention – Material And Workmanship

Excavation

One of the fundamental factors about crack prevention in concrete is for the contractor to ensure there is sound firm base to lay the concrete on. Typically it is recognised that you use a type1 MOTT (Ministry Of Transport Tested) as a standard sub-base. This ensures it meets the standards which is required on public roads. Type 1 is recognised as stone, which is 1 inch in size down to dust. Once compacted the dust and stone form a solid base. With current legislation we are encouraged to use a open aggregate with out the fines, This allows water to naturally soak away under the driveway.

This is something which is quite often a cause for dispute. We aim to place and compact our sub-base in accordance with our specification. This tends to be the minimum. If our specification is not to your standard, you can alter it to suit your needs at the time of quotation. Our specification is designed to withstand normal driveway traffic up to six tonne, and is usually adequate for most domestic driveways.

If the drive was to fracture then could it be because of inadequate sub-base? If the drive has sunk or slipped away then we could argue that the base has failed. Using the base we have put down, any fractures that have occurred have remained hairline. It is more likely fractures occur due to factors out lined in, “Cracking Factors Outside Our Control.”

Concrete (Add Mixes)

The product it self is important and the specification is laid out in our “Domestic Driveway PIC Specification”. The cement content is important since this gives the concrete the specified minimum strength. The minimum cement content per cube of concrete is laid down in our specification. The colour hardener plays a major part in preserving the surface. The colour hardener consists of sand, pigment and cement. As well as colouring the surface the cement adds strength to the surface, claiming to be 20% harder. The colour hardener we use is to British standards.

Add mixtures which are used to improve the durability of the concrete also add extra benefits. The first add mixture is the air-entrainment, this provides protection against frost. It does this by producing lots small bubbles like the inside of an aero, just on a lot smaller scale. The air bubbles allow for the normal expansion of water which the concrete may of absorbed, especially in freezing conditions. (Read “Salt And Concrete”, an exception to the rule) This helps concrete become a lot more durable in all weather conditions. This is a secondary protective measure, because we seal all our units with an impermeable acrylic sealer. So even if the sealer was to of become worn during periods of frost the concrete is still protected.

The second add mixture is the Polypropylene Fibres. These actually help inhibit (Prevent) the formation of cracks in concrete, whereas steel mesh only has functional value after the concrete has cracked. As well as adding strength to the concrete it reduces plastic cracking and enhances surface finish. This add mixture can be used without the need of using conventional steel re-enforcement in our slabs.

Crack Control Joints

With all our driveways it is necessary to incorporate crack control joints. As we know all concrete expands and contracts and we need to allow for this. We can not prevent it from cracking but we can try and control it. The industry standard for spacing of our joints is for every inch of thickness of the concrete. We should allow 3ft (just less than 1 meter). Therefore our slabs on a driveway should be cut up into sections less than 4m squared in area. This will and does help, allowing for the initial drying shrinkage, and thermal expansion and contraction associated with concrete.

We also have to take into consideration any integral items such as manholes, walls, corners of buildings etc. Any intrusions in the concrete such as these will affect it when it shrinks during the early days of curing. It is recognised that more cuts within the pattern is better than too few.

When the design of the layout is formed, it is important to allow for expansion and contraction against wall and fences etc.. The more “boxed in” our concrete is, the greater the chance of these stresses affecting it. Please be assured everything that can be done to minimise fracture will be done.

4.1.2 Cracking – Factors Outside Of Our Control

Cracking is a frequent cause of complaint within the concrete industry. Our aim here is to educate the end user when cracking should be a cause for concern. Any, if not all of the remedial work done over the ten years we have been in business, has been because of the aesthetics rather than structural failure. Cracking can not be prevented but it can be significantly reduced or controlled when the causes are taken into account and preventative steps are taken.

Public perception of cracking generally is "if it has happened, then the product has failed". In the industry it is accepted it happens, a crack which is non- structural and less than 3/8 inch in height or separation, and not leaking water, should be considered acceptable. It is in our best interest to ensure the end user is aware of this and more importantly when it should be of concern.

Before we look at the causes of cracking in concrete we must understand what concrete consists of, because it is the characteristics of these materials which induce cracking. Concrete consists of cement, sand, aggregates and water. When mixed together, the water hydrates the cement and a chemical reaction occurs bonding together the sand and aggregates.

After the concrete has hardened it is recognised that there are a number of factors out of our control, it is due to these that cracks occur. These are known as Physical, Chemical, Thermal and Structural factors.

Physical

This is something that all concrete can be affected by - drying shrinkage. To make concrete we have to use water to hydrate the cement and initiate the chemical reaction. More often than not more water is used than necessary to hydrate the cement. This is because we have to place the concrete using conventional methods i.e. barrowing, raking and tamping. We work within the S2 range, which is between 50-90 slumps (see PIC Specification). Without making concrete workable, it would not be possible to achieve the work we carry out.

Any of the excess water which is not used by the cement, will over time evaporate and work its way out of the concrete. As a result the mass of the concrete will reduce. If the mass reduces the concrete will contract. This type of contraction will create tension within the concrete and can and usually dose cause cracking.

Within our concrete slabs there are usually integral items which are crack inducing, e.g. manholes, walls, drain covers. Tension on corners as shrinkage occurs can and will usually lead to cracks forming. These cracks can occur as early as a few hours after the concrete has been placed or up to a few years.

Given the cause (drying shrinkage and integral items) and effect (cracking) we can usually predict where the concrete will contract causing it to crack. As a result we place our crack control joints in these areas. It does not stop the concrete from cracking it helps us control where it cracks.

Chemical

To make concrete, a chemical reaction takes place. This reaction continues for the full life of the concrete. The reaction progressively slows down once the concrete has hardened until about the 20 year mark, when it is thought it starts to deteriorate. Within the concrete other chemical reactions can take place which work adversely against the concrete and can be crack inducing. The corrosion of reinforcement is a process where steel in concrete starts to rust. When steel rusts it expands within the concrete and can sheer it apart.

The chemical process we are concerned about as end users is alkali-aggregate reaction. The initial reaction poses no great danger to our concrete, but we as users can aggravate this process which will lead to rapid deterioration of our concrete over night. If salt was to be put on the concrete it can accelerate the process, especially with the onset of sub-zero temperatures (see Salt And Concrete). Since salt is usually used to melt snow/ice it is only used in the winter months when it is at its most destructive. Salt alone does little to damage the concrete, it is the moisture that it attracts that does the damage.

Thermal

Temperature is an important factor which affects our concrete; it is the extremes of these temperatures which can cause the ageing/cracking. Internal concrete (concrete slabs inside buildings) will be subject to a lower range of temperatures, (between 10 degrees C and 20 degrees C), and therefore will be a lot less affected by expansion and contraction. Our driveways are subject to a range of temperatures reaching 30 degrees in the summer to -10 degrees in winter. These stresses can and will bring on unpredictable movement in the concrete.

In winter a strong frost for a prolong period of time will cause the concrete to contract. We can see this in the expansion joints we have created because they open up. Likewise, in summer they reduce in size. This happens all year long to a much lesser extent. We may notice it most when it is at one extreme in temperature. In the winter months thermal contraction can contribute to shrinkage and cause unpredictable hair line fractures, which we have not planned for with our crack control joints. We can't predict the effects of our winters on the concrete, however we can ensure the base we put under our concrete is adequate to support it, therefore any fractures will remain only hair line and cosmetic.

Structural

Our concrete can be affected by accidental overloading, by a thing or vehicle. This can cause our concrete to crack so it is important that the usage is defined before the specification is designed. (See our PIC Specification for domestic driveways.) Creep or settlement cracks is another cause for our concrete to crack. We excavate up to 200mm, the sub-grade soil below that is beyond our control.

To summarise, both contractor and end user can play their part in crack prevention and deterioration of our concrete.
The contractor can ensure they work within the accepted slump range and ensure no more water is used in the concrete than necessary within the acceptable slump range. This will reduce any shrinkage within the concrete.
The end user can ensure no salt or chemicals be used or spilled on the drive and maintain the protective sealer.
To protect against any thermal expansion and contraction the contractor can ensure crack control joints are placed in the slab at the earliest possible opportunity after the concrete has hardened.
And finally the end user can ensure the driveway is only used for the purpose it was designed for, and not to over load it.

4.1.3

Non Structural Cracks In Concrete

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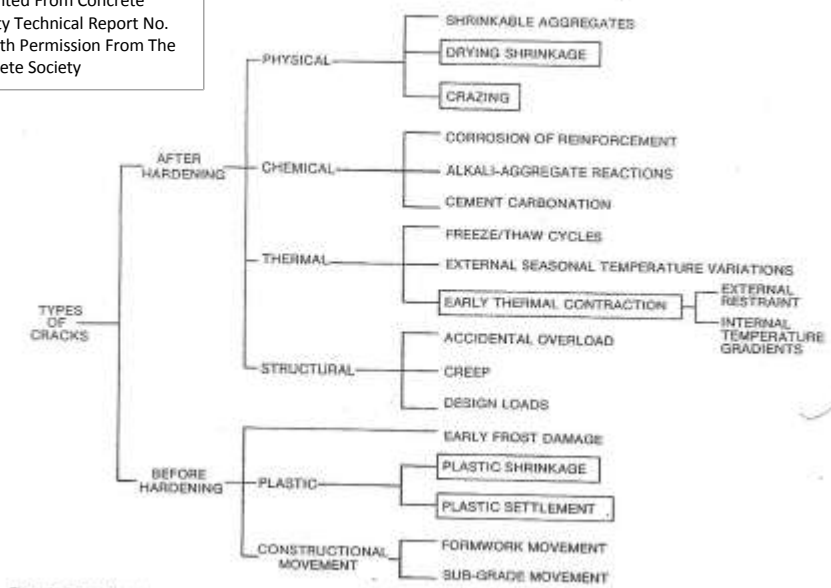

Figure 1 - Types of cracks

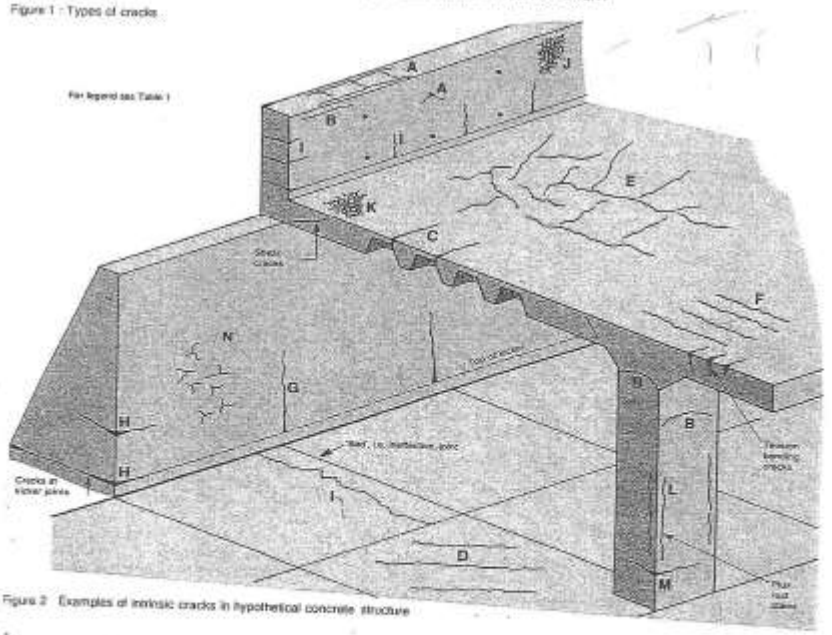

Figure 2 Examples of intrinsic cracks in hypothetical concrete structure

4.1.4

Classification of intrinsic cracks

Non-structural cracks in Concrete

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Typeot cracking	Letter (see Figure 2)	Subdivision	Most common location	Primary cause (excluding restraint)	Secondary causes/ factors	Remedy (assuming basic redesign is impossible) In all cases reduce restraint	Further details see section . . .	Time of appearance
Plastic settlement	A	Over reinforcement	Deep sections	Excess bleeding	Rapid early drying conditions	Reduce bleeding <ar entrapment) or revibrate	52	Ten minutes to three hours
	B	Arching	Top of columns					
	C	Change of depth	Trough and waffle slabs					
Plastic shrinkage	D	Diagonal	Roads and slabs	Rapid early Drying	Low rate of bleeding	Improve early curing	5.3	Thirty minutes to six hours
	E	Random	Reinforced concrete slabs					
	F	Over reinforcement	Reinforced concrete slabs	Ditto plus steel near Surface				
Early contraction	G	External restraint	Thick walls	Excess heat generation	Rapid cooling	Reduce heat		One day to two or three
	H	Internal	Thick slabs	Excess Temperature Gradients	-	Insulate		
Long-term drying shrinkage	I		Thin slabs (and walls)	Inefficient joints	Excess shrinkage Inefficient curing	Reduce water content Improve curing	7	Several weeks or months
Crazing	J	Against formwork	'Fair faced' concrete	Impermeable Formwork	Rich mixes Poor curing	Improve curing and	8	One to seven days, sometimes
	K	Floated concrete	Slabs	Over-Trowelling				
Corrosion of reinforcement	L	Natural	Columns and beams	Lack of Cover	Poor concrete	Eliminate Listed	91	More than two years
	M	Calcium chloride	Precast concrete	Chloride				
Alkali-aggregate reaction	N		(Damp locations)	Reactive aggregate plus high-alkali cement		Eliminate causes listed	9.2	More than five years

Cotgrave Driveway Designs Ltd, Newton Street, off Wiverton Road, Sturg [illegible] T&F: [illegible] E: [illegible]
Company Reg No. 4855284 Registered in England and Wales

4.1.5 Salt And Concrete

It is widely recognised that salt has a corrosive nature to most things in life, concrete is not without exception. Salt alone would pose little grave danger to concrete, but the presence of salt on concrete at various times of year, can age the concrete dramatically.
For ease of understanding we will look at the two extremes of temperature when concrete is most susceptible to damage by salt. In the U.K. we have summers which can reach temperatures in excess of 25 degrees C, and in recent years winters which have reached in excess of -10 degrees C. There are a number of **elements** which need to be present in order for these **processes** to take place and affect the concrete.

Elements
1 Concrete
2 Salt
3 Water (Precipitation)
4 Temperature

Process
1 Freeze Thaw Cycles
2 Alkali-Aggregate Reaction

At the onset of our concrete hardening mother nature starts immediately by unpicking our work. Processes known as physical and chemical weathering are contributing factors which lead to the deterioration of our concrete. Salt has the ability to accelerate these processes. It is important for us (users) to understand why this is, in order for us not to contribute to the effects of these processes.

Freeze Thaw Cycles (Physical)

This process is a physical phenomenon which puts the concrete in tension. Concrete is weak in tension (when it is pulled) yet very strong in compression (pushed together). In winter when the temperature drops below 0 degrees C, water freezes, and as a result forms ice crystals which expand its volume by about nine percent.

Concrete, on close inspection is like a sponge, and the moisture is able to penetrate the surface. If this happens before it freezes, then drops below freezing, the water in the concrete will expand, creating tension and can blow the surface. Under normal conditions this process does not pose any great danger to our concrete. (see air-entertainer and add mixture to prevent this from happening)

By applying salt to your drive in winter it will melt the snow and ice and make a salt water mush. The melting action of the salt allows water to enter the concrete. Salt is hygroscopic. It attracts water. It can cause concrete to become more saturated than it would otherwise. The presence of extra water in freezing conditions within the concrete can spell trouble. As the additional water freezes as it expands, it creates pressure greater than can be withstood by the concrete. This usually leads to the concrete sprawling.

If we have a frost which last for five days and temperatures remain below 0 degrees for the duration, then we would only see one freeze thaw cycle. That is why we only notice pipes which have not been lagged properly in our home start leaking, until after the frost has gone, even though the damage may have been done on day one.
Salt on the other hand lowers the Freezing point, depending on the content of salt in the water. The Freezing point can be any where between 0 degrees and -19 degrees. At 0 degrees there would be very little salt in the water and -19 the salt would have saturated the water.
This is where the real damage can happen, because as the temperatures and melting point fluctuate, there could be several freeze thaw cycles in one night. Each time the saturated saltwater freezes, it expands and sheers the concrete. The melt water penetrates deeper into the concrete. This is probably one of the most important reasons not to put salt on your drive. After all, this type of physical weathering has brought mountains down for thousands of years.

With our pattern imprinted concrete we do apply our acrylic sealant. This provides a barrier which helps protect the surface.

Alkali-Aggregate Reactions (Chemical)

For ease of understanding, a simple explanation will be offered in order to aid the end user in understanding the process and its effects on concrete. It is by no means exhaustive and some generalisations have been made.

The Chemical Equation (West, 1996)

2NaC1	+	Ca(OH)2 ➔	2NaOH	+	CaCl2
Sodium Chloride		Portlandite	Alkali		

Salt water Cement Alkali Silica Reaction

A simplistic explanation of the chemical equation is:-
When salt solution is mixed with the cement a reaction occurs.

Cement produces an alkali solution.
The aggregates used in the concrete may contain a reactive salt or silica.
As a result a chemical reaction occurs, which is known as Alkali Silica Reaction.
This reaction forms an Alkali Silica gel.
Rain water is the next contributing factor.
Silica gel is essentially porous sand.
The silica gel absorbs water, expands and in turn can crack the concrete.
Silica gel can absorb about 40 percent of its weight in moisture.
Once these cracks reach the surface they provide channels for more water to penetrate deep into the concrete.
De-icing salts can further augment the alkali already present in the concrete.

The pressure created by the expanding silica gel is greater than both the aggregate and cement paste which form the concrete, therefore blast it apart. While this chemical reaction naturally occurs in our concrete, we have little control over inherent raw materials which make up concrete. It is though, essential that us, as users are aware of the negative effects additional salt has on our concrete and is something we can control.

In summer it is more likely that compounds such as fertilisers, weed killer which may contain salts, exaggerate the above effect (Chemically), by producing more Alkali Silica Gel. Creation of the silica gel may initiate the concrete to crack but the greatest damage is caused by hydration of the silica/salt crystals expanding with in the concrete.

If salts are spilled on our concrete it can and will accelerate the deterioration of your driveway. In wet periods salts will be absorbed by rain water which will in turn be absorbed by the concrete. Once the concrete dries, salt crystals will be left within the concrete. It is not until the salt crystals in the concrete are rehydrated by the rain that they grow. It is this expansion which creates forces which busts the concrete. Repeated periods of evaporation and hydration increase the deterioration of our driveways.

Silica gels are commonly used in products we buy, it holds and absorbs water. You would find little packets in any thing that would be affected by excess moisture or condensation. e.g. leather products, electronics.

What can we do about it?

We use a clear acrylic seal on our driveways. This creates a barrier between the concrete and the world.
Protection is the primary reason for sealing our driveways. A by-product of the seal is that it enhances the colour, this is commonly mistaken as the only reason for sealing the driveway and therefore is the most criticised due to poor maintenance.
The acrylic seal is only a couple of millimetres thick and is the wearing course. It is tough and designed for tyres of cars and pedestrian traffic. It will scratch, chip and wear revealing the concrete underneath. The deterioration of the seal is not a failure of the product but is proof that it has served its purpose (protecting the concrete). These scratches, chips and wears will highlight the need for rejuvenating. This is the theory behind the chemical reaction which ultimately leads to the mechanical destruction of our concrete. It is important for us as end users to understand this, so we are prepared to avoid spillage of any contaminating materials and maintain the protective coating we put on our pattern imprinted drives.

Alkali-aggregate Reaction In Concrete Roads And Bridges (Graham West,1996)

4.1.6 Surface Blemishes and Repairs

"Imprinted concrete is all about the aesthetics; it is the final effect that is important. Concrete paving is **rarely perfect**; it has **inherent blemishes** because it is manufactured outside under varying site and climatic conditions. Therefore it is sensible that external work should be assessed from a normal viewpoint and in a manner in which it is likely to be viewed on a day-to-day basis." The Concrete Society, (2004)

Pattern Imprinted Concrete is a **Craft Product** that is hand fabricated on site; it does not come out of a pre-manufactured mould under controlled conditions. We are dealing with an imperfect material (Concrete) that is often installed in an imperfect environment, with variations in sun, wind and rain exposure. This means that 100% uniformity of the final product is next to impossible to achieve.

The cause of these imperfections is due to:

Impurities in the natural materials used

Lignite or "brown coal" can sometimes be found on the surface of the concrete once the concrete has hardened. These small black dots can be worked out if they are rubbed by the finger. Lignite is an impurity in the sand or aggregates when mined; they are more common in the summer months. This impurity is present in winter and summer its more apparent in the summer because we, as installers work towards the higher end of our slump range i.e. (90 slump) this is the amount of water we add to our concrete for workability. Whereas winter we will work our concrete at 50 slump. The lignite is less dense therefore it floats to the surface, the more water present the higher the likelihood the lignite will present itself on the surface hence the surface blemish.

Not a great deal can be done about lignite if it occurs; it is superficial and does not affect the integrity of the concrete. Prevention is better than a cure, so ensuring we use the best materials and concrete suppliers available to us is the best we can do. Lignite rarely cases a problem, but never the less it is something which we must be aware of. This is only apparent on closer inspection of the installation

Variable conditions (temperature, wind and moisture)

Plastic shrinkage cracking/crazing can be seen on the surface of the concrete as small cracks or stretch marks. It is affected by environmental effects of temperature, wind and relative humidity. It is more of a problem in hot weather e.g. On a sunny day with a strong breeze and low humidity, the moisture on the surface of the concrete will evaporate quicker than the chemical reaction to make the concrete go hard. This leaves us with small cracks or stretch marks. While these do not affect the integrity of the concrete it can detract from the appearance. At present there are no specific admixtures developed to handle this type of cracking. This is only apparent on closer inspection of the installation.

Formation (The Craft) of the final product

When we talk about the craft we are talking about the specific skills which are necessary for us to be a competent PIC Installer. You would expect any competent Ground worker/ Civil engineer to be able to get up to the stage of placement of concrete. The next stages are described in order to high light inherent blemishes which are caused and are present within PIC.

Application of Surface Colour Hardener this is applied by hand over the surface of the concrete. This is troweled in using two sets of floats, firstly using a rough float (Magnesium Float). This keeps the surface of the concrete open and porous for a second or third application of colour to be applied. Finally it is smooth floated using a smooth steel trowel, sealing the surface leaving it like glass. The application of colour needs to be as uniform as possible but has slight variations in depth of colour. This can be especially true where the slab is partially in the sun and partially in the shade. The surface colour hardener provides the base colour and increases the strength of the surface.

4.1.6 Surface Blemishes and Repairs

Float Marks are part and parcel of printed concrete, to the trained eye all installation have some form of float marks. Given ambient conditions the surface will dry almost seamlessly. Once again the weather can affect the finish the closer we are to the ambient conditions the better the finish.

Application of Release Agent is the next stage prior to printing. Its purpose is to stop our mats/moulds from sticking and plucking. It also provides the secondary colour; this is known as an antiquing agent. The antiquing agent takes differently depending on how hard the Matts are banged/stamped and how firm the concrete is when printed. Variations in the slab will lead to variations in the antiquing. i.e. shaded areas compared to areas in direct sun light. We have limited ability to manipulate the antiquing, the aim is to get it as uniform as possible.

Printing of the installation can cause surface blemishes, what we call spits/chips. As we start printing, the concrete continues to cure and get harder and harder. As we force the Matts into the concrete by stamping, any stones/Aggregates close to the surface can flick out. This can leave small chips which will need touching up. Once again if the slab is in a partially shaded area and some in the sun. The concrete will cure at different rates therefore the depth of print may vary a little.

While every effort will be made to minimise these surface blemishes we must appreciate that they are also an integral part of any Pattern Imprinted Concrete Installation. All installations are unique and are one offs. We have a window to do our work and slight variation in pattern print, depth, texture and colour is to be expected. From the start of printing the concrete it continues to cure, right the way up to the last mat being placed and printed.

Virtually every pattern imprinted concrete job is going to require minor touch-ups, whether its colour variance, chips or small cracks. When dealing with environmental issues like dry, windy conditions placing stamped concrete can be extremely challenging you may end up with small surface tears or plastic shrinkage cracking. All repairs will be carried out prior to sealing; some repairs may be left at the company's discretion if it was thought the repair will not enhance the aesthetic appeal of the installation.

4.2 Sealant

Why Seal Concrete?
To protect the surface.
To extend the life of the installation.
We have created the desired surface you require, weather it be stone, slate, cobble sets wood effect etc.. We want to maintain the look for as long as we possible can. The surface of all concrete is like blotting paper, it will absorb pretty much anything which is spilled, or absorb pollutants within the air. This can cause discoloration, but even worse it can cause our concrete to prematurely deteriorate. The corrosive nature of water and salt can destroy our concrete, therefore we use sealers to protect and preserve our drives. With printed concrete you will find that that the aesthetics is just as important as the functionality of the product.

What Is Seal?

Types Of Sealer
As you may of already anticipated there are more than one type of sealer available to us, so which one do we use on our drives? Concrete sealers fall into two broad categories **Penetrative Sealant** and **Film Former Sealant**.

Penetrative Sealant
Penetrating sealants react chemically within the capillaries of the concrete to shield against moisture penetration and de-icing chemicals. Usually they provide invisible protection without changing the surface appearance. Therefore this is only available in a matt finish. These sealers are expensive and can not be altered once applied. While this is probably the most hard wearing sealant it may not provide the desired out come in terms of aesthetics, which we can not reverse once done. The type of penetrating sealants available to us are; Silanes, Siloxanes and silicates.

Film Former Sealant
These form a protective film on the surface of the concrete as the name implies and is the type most often used in the decorative concrete industry. Most film former sealants have an added benefit, (Or by product) by adding a sheen that highlights the beauty of the coloured concrete. There are three primary types of film formers available to us, each possessing different advantages and limitations.

Polyurethanes
Are twice as thick as acrylics and offer excellent resistance to wear and tear and chemical attack. Polyurethanes are moisture intolerant until they cure. This means that if any moisture is present when the sealer is applied, a chemical reaction occurs this results in foaming and bubbling. It is available in solvent and water based formulations.

Epoxies
These produce a long wearing abrasion resistant finish but epoxies have a tendency to yellow with UV exposure so they are generally limited to interior applications. Some products are impermeable and could trap moisture in the concrete. Most are two component products mixed prior to application. These are not suited to our needs therefore not worth considering any further, for use on our driveways.

Acrylics
Acrylic sealants are generally the easiest to apply and most economical. They are UV resistant, non yellowing and provide good protection against water and salt intrusion. They are however much thinner than polyurethanes and epoxies so they wear faster and usually require re application sooner. These sealers are available in both solvent and water based formulations. Solvent based sealers tend to be harder wearing than water based.

4.2.1 Why Use Acrylic seal?

We use acrylic sealers because they provide the best performance characteristics for the cost. They can also be easily manipulated and rejuvenated when worn.

It can be re-emulsified.
The seal comes in a tin of 25 litres of which a percentage is of solid content (Usually between 20-30%). This solid resin is dissolved in a liquid/solvent. We spread the liquid (in which the resin is dissolved) over the surface of the concrete. As the solvent evaporates it leaves a thin layer of the resin over the surface which solidifies to form the protective coating.
While polyurethane sealer is very hard wearing it is very unforgiving as it will not re-emulsify. It must be removed mechanically by grinding or stripping with nitric acid. Both sealer and nitric acid are expensive and it is a time consuming job. For the same cost of these sealers our acrylic seal can be redone time after time. Any areas which my need a "touch up" where a car tyre have left a mark or scratch this can be easily done with our acrylic seal.

Use Of Additives
The other sealers are a lot thicker, therefore can be a lot more slippery.
We use additives to increase traction (Anti-slip and Uncle Grip);

Anti-slip increases the texture of the seal. It is a slip resistant additive. As standard we use this in all our seals. This is added to the seal and suspended within it. It is barely noticeable to the eye once applied.

Uncle Grip on the other hand is a different animal. It is a form of crushed glass. It looks like sugar. It is too heavy to suspend in the seal so has to be applied on top of the seal. If the seal is too thick then the additive is embedded within the coat of seal and not protruding to create the desired traction.

Matting Agent
The acrylic seal comes as a gloss finish as standard. A matting agent can be added to take the sheen/gloss shine away if desired.

Coats Cross-bond
This means no matter how many coats are applied over the years it forms one solid layer. The important factor here not too much or not too little, like most thongs in life we need to find an optimum. It is imperative the coat thickness is just right. See our guidelines on how to reseal your driveway.

Benefits And Limitations of Acrylic Seal

Acrylic seal

Benefits	**Limitations**
Costs less than other sealers	Not as thick therefore doesn't last as long.
Transparent	Not as hard wearing
Non-Yellowing	
It will re-emulsify	
Each coat will Cross Bond	
Additives -Matting agent	
-Anti-Slip	
-Uncle grip	
Easy to touch up	

4.2.2 Blooming Seal

From what I understand the term “Blooming” is a sprayer’s term, which describes the effect of moisture which may have been present when the seal/paint was applied. Blooming may affect our drive in the short term and it is only the aesthetics which are affected, the functionality of the seal remains unaffected.
Because of the nature of the product i.e. Concrete is made with water and usually over hydrated to make it workable to place. The excess water will need to work its way out of the concrete naturally. In the event of the concrete being sealed before the excess moisture has worked its way out, we get this affect of blooming.
As the moisture works its way to the surface the seal turns white or seem to loose its colour. This can be progressive and happen in different areas, depending on the content of moisture retained in the concrete slab.
We can do moisture test to measure the content of moisture in the slab, but we rarely do this because
-it is complex process
-time Consuming
-Inconvenient (Customer Non Use of Drive)
-inconvenient (Company Carry out the test)
-It does not prevent blooming

So inevitably our driveway and patios are sealed, before the slabs are fully cured. This allows customers to use the Driveway or patio knowing that it is protected; the only draw back is that it may bloom. This can be easily resolved by applying solvents to rejuvenate the seal and release any moisture.
The time of the year and the air temperature affect this considerably. During the winter months (November through to March) the curing process takes a lot longer, so it is important to make the driveway/Patio usable.
In the summer months blooming is rarely a problem, the concrete cures a lot quicker and the seal can be applied earlier, therefore there is least inconvenience on our behalf (The Company) and the customer’s behalf. This could be an important factor when considering a purchase of this type.
The seal can also be affected if it comes in to contact with moisture weather it be rain or a spillage of water. If water or moisture should come in contact with the seal then, the application of the seal will need to cease immediately. Mixing seal with water will turn the seal white. Nothing can be done at this stage until the area has been completely dried again. Solvents are then used to blend in the affected areas. This would be more of an inconvenience than any thing else. The quality of the appearance would be affected; it would not affect the integrity of the seal.
Any blooming issues for our customers can be reported via our web site and we will attend at the earliest convenience. Re-sealing and de-blooming only happen during the summer months (April through to September). Our web site can also be consulted with regards when to expect any reinstatement to be done.

Cure Seal
In addition to straight sealers, which typically must be applied to concrete that has been allowed to cure for at least 14 days, you'll also find products on the market called "cure and seals" - hybrid formulations that will both cure and seal concrete in one application. Most cure and seals are water- or solvent-based acrylic resins. These products can be applied to freshly placed concrete in lieu of a curing membrane and as a sealer on concrete of any age.
These Seals are more expensive and are less hard wearing than our straight seals. The Cure Seal allows the concrete to breath; moisture can escape through the seal therefore preventing Blooming. Cure seals do not offer the same aesthetic appeal as the straight seals and are only available in matt finish.
Finally once the slab has cured it is recommended to seal the drive with a straight acrylic seal, for a longer lasting, harder and more aesthetically pleasing finish. This can be done 3-6 months after the installation, and application of the cure seal.
At standard we seal all our installations with a solvent based acrylic seal, any blooming issues are dealt with within the seal warrantee in our Guarantee and addressed during the summer months..

Maintenance program
As with all products which are used, a maintenance programme is essential to keep the installation protected, and looking great for longer. We offer an extended warrantee for accidental damage, along with annual inspection and maintenance on request. There are basic instructions within this User Guide to aid you should you wish to do it yourself. Sealing products, additives and tools can be bought via our website.

4.2.3 Sealing Guidelines

From time to time your drive will need resealing because the seal has worn or you simply want to polish it up ready for the summer. The gloss or sheen of the sealer may fade because the sealer is what comes between the concrete and the traffic and spills, what looks a dull or faded surface is often just a scratched, worn sealer and not damaged concrete.
We have always been told that the acrylic seal we use will last three to five years under normal weathering conditions. It's not just the weather though, that erodes the seal. Wear and tear needs to be taken in to consideration. Good house keeping is the key to maintaining your driveway/ patio and keeps it looking great for longer. **Preventing scratches**, **cleaning properly** and **resealing** when necessary will keep decorative concrete looking at its best.

Good Housekeeping

Preventing Scratches

Lifting and placing furniture rather than dragging it "treat decretive concrete floors as you would a hardwood floor and it will last a lifetime.
When using ladders on drive or patio dropping ladders underneath the bay window to clean the upstairs windows will scratch. Use a rubber mat it will create a barrier between the concrete and the metal ladders.
Children's bikes being dropped on the concrete (probably easier said than done)
Deliveries especially of large bulky or heavy items, dragged or dropped will scratch.
Using shovels to move things off your drive, i.e. Snow, soil, any kind of spillage etc.. metal on concrete will scratch.

Cleaning Properly

If something is spilled on your drive/patio then clean it up at the earliest convenience. The seal will initially protect the concrete via the protective film it has formed between the concrete and its environment. Prolong periods of spillages being left on the drive can lead to the spillage migrating through the seal.
Best cleaning practices start with the least aggressive methods first.
Sweeping/ Vacuuming
Wipe with damp cloth/mop using water
Degreasers like washing up liquid
Always read product labels, if it says do not use on acrylic. Do Not Use on acrylic.
Be Careful with the usage of Fertiliser/ avoid over spill onto drive/patio
Avoid using de-icing salt/chemicals, Use sand to increase traction.

Resealing

Inevitably the drive or patio will need resealing during the course of it life. Even though it may not need resealing for up to two to three years, from experience a little bit often is better than the all at once approach. Resealing your driveway or patio can be done by yourself, but a few key principles should be understood first. From this we can offer a best practice with regards to resealing.

Principles Of Resealing

Climate

1➔ Resealing is best achieved during the summer months; we only carry out reseals during April through to September. (Humidity is key here, See migration of water)
2➔ The acrylic seal is moisture intolerant, the slab must be dry. One spec of water will cause the seal to go milky. (See kit list to enable you to dry the slab)

Seal

1➔ The acrylic seal is suspended in solvent prior to application.
2➔ Once the solvent has evaporated we are left with the acrylic film on our drive.
3➔ All sealer coats cross bond to form one layer.
4➔ This single layer can vary in thickness if the slab is over sealed and delaminating occurs (see example)
5➔ This is our protective coating, which is the wearing coat of our drive.
6➔ Any areas which have worn will need treating prior to the drive being resealed.

Best Practice

Prep

1➔ Pull all silicone from joints.

2➔ Use a blower to blow any water out of the joints.

3➔ Ensure there is no presence of any water, use a burner or leave to dry.

4➔Any areas of wear will need to be treated with solvent.

-Apply solvent to the surrounding area and work in until it becomes tacky.

-This may take five minutes before the solvent has broken into the seal

-You may need to add more solvent to the area as the solvent evaporates and workability is reduced.

-The solvent will breakdown the existing seal and suspend it in the solvent.

-The aim here is to achieve one even coat of seal in that area being worked on.

This is to ensure we do not get areas varying in thickness of seal; this will detract from the appearance of the drive.

E.g. If we resealed the drive each time we got tyre tracks in the drive, without thinning out first. We will have the tyre tracks with one new coat of seal; where as the surrounding areas will have several coats of seal. This will be clearly visible and will detract from the appearance.

5➔ Thinning out should be done throughout the whole job, with particular attention being made to areas of wear, these need to be evened out.

7➔ All jobs should be cleaned with solvents or thinned out before considering topping up the seal/resealing.

8➔ Once the seal has dried any areas which have matted down or look dry we will need to consider the reseal.

9➔ A well sealed unit may not need any more seal, therefore if it looks right it probably is right.

Reseal

1➔ If the unit needs resealing then see the table below, this is what you should be looking out for.

Description	**Solvent%**	**Seal%**
Very Matt Little evidence of any seal present	0	100
Small areas have matted down Looks patchy	50	50

2➔ Do not be tempted to over seal the unit, too much seal can lead to other problems. An optimum amount is necessary, the process above describes the rules to be followed.

Summary

1➔ Always clean the unit with a solvent first, paying particular attention to any worn areas. Thinning it out is crucial to achieve one even coat of seal. If the unit is well sealed you will not need to apply any further coats of seal.

2➔Doing this on a regular basis (Once a year, in spring) will ensure your unit is adequately sealed, and protected and looking at its best for the summer months.

3➔It is a cost effective, since you are looking after your investment.

4➔Only add sealer coats if necessary.

5➔For seal related topics see the “Resealing- trouble shooting topics” Blog section of our website

5.0 General Terms and Conditions

Conditions of Contract

1. In addition to its statutory obligations, the Company warrants that within a period 5 years of completion of the Contract the Company will make good, free of charge, any defects which are due to faulty workmanship or materials, provided the facility is treated with reasonable care and any maintenance instructions have been adhered to. Written notice of any claim against this warranty must be received within 14 days of the expiry of the warranty period.
2. The Company agrees to provide the equipment and/or execute the works set out on this quotation at the price and in the manner of payment specified in the Quotation and/or in these Conditions. On acceptance of our quotation you are deemed to have agreed to our terms and conditions of purchase.
3. The Company shall be entitled to payment as stated in the quotation.
4. In the event of the Purchaser failing to make payment as required by these Conditions, the Company shall be entitled to cancel any discount given and full amounts shall become due.
5. Provisional costs (PC) are estimates of costs only as no accurate cost can be given at the time of quoting.
6. The price specified in the quotation is based on the cost of wages and materials, plant hire and taxes prevailing at the date of quotation, and is valid for 3 months from the date shown in the Quotation Except that where PC sums are shown adjustments are to be made to the quotation on completion of work.
7. Any planning permission building permits where required shall be obtained by and any changes related there to be paid by the Purchaser directly to the relevant authority.
8. The company will work in accordance to the guidelines laid down by “The Concrete Society,2004”, any circumstantial deviation from the guidelines will be at the company’s discretion.
9. In carrying out preparatory work on site, implementing the Contract and clearing the site on completion, every possible care will be exercised by the Company to minimise the disturbance caused by vehicles, plant and all equipment using the access routes to reach the working area and the area immediately around the Contract site which is required for the working space and the Company will clear the working area on completion.
   During this period the Purchaser will be required to take care to protect the site and its surroundings and in particular to prevent any person or animal not authorised by the Company from trespassing in the working area or interfering with machinery, equipment or other materials stored there. Beyond such reasonable care being taken, the Company does not take responsibility for the cost of reinstatement. Any damage must be notified to the Company in writing within seven days of the occurrence.
10. The Company shall not be liable for any delays for any reason whatsoever beyond the reasonable control of the Company including, without prejudice to the generality of the foregoing: inclement weather or unreasonable site conditions, proceedings taken or threatened by other disputes with third parties, delay by other Contractor or workmen or tradesmen engaged or nominated by the Purchaser not referred to in the Quotation, authorised extra or additional items being added to the Contract, any local combination of workmen, strike or lock-out difficulty in obtaining suitable materials, then the Company shall not be liable to the Purchaser for the delay in the completion of the work and a fair and reasonable extension of time for such completion, at least of the period of the delay, shall be allowed by the Purchaser.
11. In the event of any dispute arising during the course of or subsequent to completion of work, the Purchaser shall not be entitled to withhold payment in excess of an amount representing a reasonable valuation of the work required to rectify or replace the work that is specifically subject to the said dispute.
12. The Quotation is based on the assumption that excavation will be in normal sub-soils and that no hidden obstacles will be encountered during any part of the work. If rock or running sand, unstable ground, excess water or any other unforeseen circumstances and/or any service such as water, gas, electricity, telephone, drainage etc. not previously advised to the Company to exist is met with, the Company reserves the right to charge for any additional work involved. The cost of any work, by the Company or others entailed in dealing with it shall be additional to the figure as quoted.
13. The Quotation assumes that, and is subject to ground conditions being suitable for the carrying put of any such work. Any additional cost incurred by local body requirements, Engineers requirements, or which the Company reasonably determines is necessary to properly prepare the ground, shall constitute an extra and be paid by the Purchaser upon completion of work.
14. The Company will exercise all reasonable care to place pattern aligned expansion and contraction joints at his discretion to minimise the chance of cracking, but no guarantee is given against cracking. Sealer coats cannot be guaranteed (see Users' Guide).
15. The nature of the process causes variations in the depth of imprint. Every effort will be made, however, to achieve consistency of depth to the Purchasers requirements.
16. The process tends to imitate the traditional finish of bricks and cobblestones and all surfaces blemishes are part of the finished product

5.0 General Terms and Conditions

and left at
the Company's discretion.

17. The nature of materials and processes used make it unavoidable that apparent variation in texture and colour of the surfacing material may occur.
Whilst every possible care will be exercised the Company cannot guarantee colour and texture matching to closer tolerances than those inherent
in the materials and processes used.

18. The Purchaser is responsible for providing complete free and easy access to the working area of the site for materials, machinery and the provision
of all necessary electrical, water and other services any additional costs incurred through the Purchaser not providing such shall be chargeable to
and payable by the Purchaser.

19. Concrete products require a curing period after laying operations have been completed. The length of this period is usually governed by the weather
and the type, volume and weight of traffic to be encountered. At the time of handing over the completed facility, the Company will advise the
Purchaser on this and other precautions that are required to be taken. The Company cannot be held responsible for any damage that may result
from the failure to follow these instructions, and such a failure may invalidate the warranty given by the Company under this Contract.

20. Subject to the provision of the 'Unfair Contract Term Act 1977' (or any statutory modification thereof) the Company shall not be liable for any
damage, loss or personal injury whatsoever arising consequential upon or incidental to the use of the works referred to in the Quotation either
during the period of construction or at any time thereafter.

21. This Contract is not subject to cancellation and any deposits paid are non refundable.

22. The Contract is accepted subject to a satisfactory survey being carried out by the Company, in the event of an unsatisfactory survey the Company
reserve the right to cancel the Contract, the customer would be notified within 28 days.

23. Where part of the work is being carried out by the purchaser our price submitted is based on this work being carried out in a workmanlike manner
and strictly to the agreed time schedule with regards to proper preparations so our work is not jeopardised in any way. This particularly applies to
the excavation work; Additional costs involved in our work due to bad workmanship or hindrance on the part of the Purchasers workmen will
constitute an extra charge to the Purchaser.

24. Where extra work is ordered by the Purchaser, either in writing or verbally, this order will be confirmed by the Company to the Purchaser in writing
and unless within seven days the order is rescinded the same shall be treated as confirmed. Where possible, Quotations will be submitted for
additional works and variations as the Contract proceeds but otherwise will be charged at a fair price, based on the cost of such variations.

25. The Company shall not be held responsible for minor departures from the Contract specification or drawings made necessary by site conditions or
unforeseen circumstances.

26. All materials and equipment on site, which form an integral part of the Contract, shall remain on the property and shall be in the exclusive possession
of the Company until payment in full for the Contract has been made.

27. This Contract shall be subject to the jurisdiction of the English Courts and construed according to English law. Any dispute arising under it shall be
referred to an Arbitrator to be appointed by the parties and in default of the agreement by the President for the time being of the RIBA and whose
decision shall be final and binding. Such a reference shall be a submission to arbitration under the Arbitration Act 1950 or any statutory modification
or re-enactment there of.

28. Any variation in these Conditions must be agreed by the Contractor and Purchaser before commencement of the work and to be valid, shall be
signed by all parties concerned.

29. No responsibility can be taken for clients spreading salts over the finished surface area.

6.0 Complete Driveway Designs Ltd Guarantee

Complete Driveway Designs Ltd offers a materials and workmanship guarantee to all our customers. All workmanship and materials will follow the guidelines specified by the "The Concrete Society – Imprinted Concrete Model Installation Clauses and Guidance 2004"
It is intended to assure our customers that we will carry out all work in accordance with standard construction practices, using the highest quality materials available to us.
The standard specification is designed for a load bearing of up to a maximum of six tonne, and is intended for domestic drives in the UK. The customer must ensure the specification laid out is to their specific requirements and usage. The specification can be altered upon request by the customer at the time of quotation.
Our Guarantee reads -

FIVE YEAR WORKMANSHIP GUARANTEE
THE COMPANY GUARANTEES INDIPENDANTLY THAT THEY WILL MAKE GOOD FREE OF CHARGE ANY FAULTS WHICH ARE A RESULT FAULTY WORKMANSHIPAS ESTABLISHED BY THE COMPANY TO A PERIOD OF FIVE YEARS FROM THE DATE OF COMPLETION AND/OR RECIPT OF FULL PAYMENT.

FIVE YEAR MATERIALS GUARANTEE
THE COMPANY GUARANTEES INDIPENDANTLY THAT THEY WILL MAKE GOOD FREE OF CHARGE ANY FAULTS WHICH ARE A RESULT FAULTY MATERIALS ESTABLISHED BY THE COMPANY TO A PERIOD OF FIVE YEARS FROM THE DATE OF COMPLETION AND/OR RECIPT OF FULL PAYMENT.

It's important to appreciate however that like most guarantees it is subject to certain terms and conditions. To give you a better understanding of these we have taken this opportunity to detail these here.
One of the most important factors when placing your business will be your guarantee.

Our guarantee are subject to certain conditions –

- -Subject to adhering to the curing times for our mixes
- -Not allowed to spread additional compounds on the installation. E.g. Salt
- -Must be used with reasonable care (See User Guide – Maintenance)
- -Any Maintenance required in the form of sealant must be carried out in order to protect the surface.

Exclusions to our guarantees-

- -A regular exclusion to most guarantees is consumables (See the seal warranty).
- -The most misunderstood guarantee is fracture (See the concrete warranty).

6.1 Concrete warranty

Dear Customer,

We at CD Designs try very hard to ensure that for many years to come, you will have excellent and long lasting concrete driveway. We will do everything we can to satisfy you as a customer.

Every foreman and assistant at CD Designs has been trained to construct, place, print and finish our concrete to the highest of industry standards.

We work hand in hand with our suppliers to provide you with the highest quality materials available.

It's our company policy to offer a 1 year warranty on the concrete. The warranty and what to expect from your concrete is detailed in the following paper work.

If you would like more information or would like to view some pictures, please feel free to visit our website www.completedrivewaydesigns.co.uk. Here you can review past and current issues regarding pattern imprinted concrete. Visit our frequently asked questions section or drop us an E-mail.

What To Expect

Cracks-

Yes. All concrete cracks. We don't like it either, but never the less it happens. We take measures to minimise cracking (see "Measures to Minimise Cracking") by placing crack control joints in our slabs/driveways.

Concrete typically cracks soon after it is placed. This is normal and is largely due to shrinkage, hence the reason for the control joints. We do everything we can to control cracking, but there is no guarantee that concrete will not crack in other places. Cracks three eights of an inch or less (height difference or gap) are normal.

Fracture of the concrete (cracking) is subject to many factors out of our control. There are physical, chemical, thermal, and structural factors which we have no control over, (See "Cracking - Factors Outside Of Our Control" to be read in conjunction with "Measures to Minimise Cracking") therefore we do "the best" with what we do have control over, to minimise the chance of fracture.

Surface Blemishes -

A common misconception is that your driveway will last and wear the same as internal concrete floors. Unfortunately this is not true. Exterior concrete is subject to inclement weather/temperatures (in the UK particularly) and heavier loads e.g. vehicle traffic.

While concrete is a very durable product it's not without its flaws. Sometimes the top of the concrete may appear to be popping or flaking off. It's quite possible that a stone(s) close to the surface has popped out. This is especially true when printing.

This is nothing to worry about, popping and flaking is most common at the end of our drives. This is because the end of the drive is exposed to the most wear and tear, due to vehicle and pedestrian entering and leaving.

In Winter road salts will be dragged onto the drive which can add to the wear of the surface (wash off asap). We recommend that any snow is first removed, followed by a scattering of sand. Use salt at your own risk. It will damage the concrete.

Extremes in temperature can affect the surface. Extreme heat can in the summer pop the surface. This can leave the concrete slightly pitted and is only noticeable on close inspection.

The other extreme, the freeze-thaw cycle also affects the concrete. Depending on the severity of the frost, this is a lot more destructive than the pitting that excessive heat can cause. (For more information please see www.completedrivewaydesigns.co.uk/maintainance .

Shifting –

Most driveways will have some settlement over time. This is usually minimal and barely noticeable. If you notice your driveway has moved it is nothing to be concerned about. Prolonged temperature change can induce temporary shifting due to expansion and contraction.

This is not something we warranty. We do compact the sub-base under your drive. But there is no guarantee it will not settle. We can not warranty against settling because the sub grade under the 8" of our excavation is something beyond our control.

Texture -

It is possible that your neighbour's concrete may appear to have a different texture or finish on it. This is very common and is no cause for concern. Variables such as time of year, temperature and weather conditions can affect the texture. These are largely out of our control, we have to work with changing conditions to manipulate the concrete.

Discoloration

Another common misconception is colour. It is not possible for us to match the exact colour of existing concrete (raw concrete). Some, if not most drives need two or more loads of concrete. While the amount of the raw materials remain the same to make the concrete, the makeup of content of the raw materials may vary slightly.

This is especially true if areas have been added to over time. Most of these colour variations are minor and most will fade over time, but they can and do occur.

Concrete cures fastest in the first seven days, after that it continues at a much slower rate for several years or so. This also can affect the colour as the slab matures. This is a good thing to keep in mind when planning a project, since this could be more noticeable than the texture or surface blemishes.

Variations in Print

As any drive or patio is printed, there will always be a start point and finish point. As soon as our first matt is printed there will be a lapse of time before the last matt will be printed. The concrete will continue to sett getting firmer and firmer as time goes on hence there can be variations in print depth and texture.

It is rare that the depth in print is noticeable, and we will do all that is possible the ensure our customers get the depth of print they require. Shaded areas can take longer to set than those areas of a slab which are in direct sun light this can lead to slight variations in the print.

Variations in Colour (Primary/Secondary Colours)

The primary colour is known as the "surface colour hardener". It is a mixture of pigment, cement and sand. This is the base colour of the installation. The process requires us to apply it by hand over the whole of the job. This is not an exact science, therefore there can be slight variations in the depth of colour.

The secondary colour is known as a release powder. This serves two purposes. Firstly it prevents our mats from sticking to the concrete(it forms a barrier). Secondly, it adds colour to the joints of the stone sets, cobble or pattern of your choice.
Like the depth, the print is affected by how firm the concrete is at the time of printing. The release also takes differently. A soft print will usually produce an area with an high amount of the secondary colour. Where as a tighter print can produce a lighter amount of secondary colouring.
This is what makes imprinted concrete an art. It doesn't come out of a mould. It is formed and crafted and ultimately produced on site, under varying conditions. The key factor here is uniformity, rather than any kind of absolutes.

What the Warranty Covers

Cracked concrete

(Industry standard before repair or replacement is 3/8")

We warranty cracks that are 3/8" or greater in separation or height difference.

Popped Or Chipped Concrete

(Industry standard before repair or replacement is a minimum of 20%)

We will only repair or replace the section(s) that fall into the category of what we warranty.
We will repair or replace if a minimum of 20% or more of any given section of work we did is popped, pitted, or if small pieces located on the edges happen to break off.
Warranty issues will be addressed during the months of May through to September. This is when the ambient conditions are most likely. It will enable us to complete any remedial work efficiently in order to cause the least inconvenience.

Customer Care Of Concrete

To Maintain Your Concrete

We ask that no salt ever be used on your concrete. It is crucial that you do not use salt for the first full year. We cannot emphasize this point enough. Sand is very safe to use on your concrete and is recommended, especially for the first year.

Popping of concrete on drives where vehicles are parked is common. During the winter months the salt on the vehicle(s) will drip off onto the concrete. Salt, being highly corrosive, will eat into the surface of the new concrete. Salt over-spray from the road can also affect the entrance of your drive.

Another highly corrosive material is fertiliser. Be careful if you use any fertiliser, and wash off immediately any spillage or over-spray.

6.2 Seal warranty

Dear Customer,

We at CD Designs try very hard to ensure that for many years to come, you will have an excellent and long lasting concrete driveway. We will do everything we can to satisfy you as a customer. Every foreman and assistants at CD Designs has been trained to construct, place, print and finish our concrete to the highest of industry standards. We work hand in hand with our suppliers to provide you with the highest quality materials available. It's our company policy to offer a 1 year warranty on the seal. The warranty and what to expect of your seal is detailed in the following paper work. If you would like more information or would like to view some pictures, please feel free to visit our website www.completedrivewaydesigns.co.uk Here you can review past and current issues regarding pattern imprinted concrete. Visit our frequently asked questions section or drop us an E-mail.

What To Expect

All our driveways are sealed with an acrylic seal. The seal provides a number of functions. It provides us with an aesthetically appealing drive. It helps protectsthe surface from the elements, and is oil resistant (any spillages must be cleaned up at the earliest opportunity)

Under normal weathering conditions the seal is expected to last five years. Taking wear and tear into consideration the seal will need resealing depending on usage.

You can expect the seal to wear between 3 months for heavily used drives up to three years for patios. The approach to any drive is the first place to expect any wear. There is no guarantee on sealer coats.

Once the drive is sealed the crack control joints will be sealed up with mastic/clear silicone upon request. This is done once again to enhance the aesthetics and prevent silt from collecting in the joints, which in turn weeds will grow. This requires re-doing periodically, usually seasonally.

As with most guarantees any consumables are exempt. Since both seal and silicone are items of regular wear and tear, we cannot offer any guarantee.

What the Warranty Covers

-Blooming

(For more information on blooming visit www.completedrivewaydesigns.co.uk/maintainance)

All newly placed concrete retains an amount of moisture once it has been placed and left to cure. We endeavour to seal your installation at the earliest opportunity once it has cured, in order for you to use your drive. Concrete takes a lot longer to cure during the winter season, retaining moisture which has not been used to hydrate the cement.

Blooming occurs on slabs of newly sealed concrete which has not fully cured. Blooming takes the form of white patches appearing on the installation over a period of time. It is progressive and continues until an acceptable amount of moisture has been released from the drive.

A bloomed drive remains protected and my be used as normal, until we are able to return and de-bloom your installation. There are no adverse affects by using a drive that has bloomed.

There are methods of measuring moisture content in concrete, but these are complex, time consuming and it does not prevent it from blooming. The company will seal the drive when it sees fit. The aim being to cause the least inconvenience caused to both parties. If you think your drive has bloomed then please read the maintenance section on blooming in our website. There is a standard remedial form for you to fill in (follow the link above).

Blooming related warranty issues will be addressed during the months of April through to September. This is when the ambient conditions are most likely and essential for de-blooming. It will enable us to complete any remedial work efficiently in order to cause the least inconvenience. Resealing can not be undertaken during the winter months.

Customer Care For Seal And Silicone

Any installation must be used with reasonable care, and any maintenance required must be attended to. This must be carried out in order to protect the installation. You will notice a slight colour change when the seal wears away, because the raw coloured concrete will now be visible, this colour will return once it is resealed. It is the customer's responsibility to ensure any worn areas are protected. On our website see the section on maintenance "How to reseal my drive."

Thank you for taking the time time to read our user guide, and we hope that you enjoy your pattern imprinted concrete for many years.

If there is any information you require then please do not hesitate in contacting us.

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